

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently Amended) A transducer for converting between mechanical and electrical energy, the transducer comprising:
at least two electrodes; and
a polymer arranged in a manner which causes a portion of the polymer to deflect in response to a change in electric field and/or arranged in a manner which causes a change in electric field in response to deflection of the polymer, wherein the polymer includes an additive to improve the operating performance of the transducer and wherein the polymer has an elastic modulus at most about 100 MPa without electrical energy applied thereto.
2. (Original) The transducer of claim 1 wherein the additive improves at least one of polymer dielectric breakdown strength, maximum linear strain, dielectric constant, elastic modulus, response time, and actuation voltage.
3. (Original) The transducer of claim 1 wherein the additive comprises at least one of a plasticizer, an antioxidant, and a high dielectric constant particulate.
4. (Original) The transducer of claim 3 wherein the plasticizer comprises a material selected from a group consisting of high molecular-weight hydrocarbon oil, high molecular-weight hydrocarbon grease, Pentalene H, Piccovar® AP Hydrocarbon Resins, Admex 760, Plastolein 9720, silicone oil, silicone grease, Floral 105, silicone elastomers, nonionic surfactants, and combinations thereof.
5. (Original) The transducer of claim 3 wherein the antioxidant is a nonvolatile solid antioxidant.
6. (Original) The transducer of claim 3 wherein the plasticizer reduces the elastic modulus of the polymer and/or increases the dielectric breakdown strength of the polymer.

7. (Original)The transducer of claim 1 wherein the additive improves one of the ability of the polymer to convert between mechanical and electrical energy and the adhesion of the polymer.

8. (Original)The transducer of claim 1 wherein the polymer is elastically pre-strained.

9. (Original)The transducer of claim 1 wherein the transducer is included in an actuator, a generator, and a sensor.

10. (Original)The transducer of claim 1 wherein the transducer is included in one of a robot, a motor, a pump, and a toy.

11.-44. (Cancelled)

45. (Currently Amended) A transducer for converting between mechanical and electrical energy, the transducer comprising:

at least two electrodes; and

~~a polymer arranged in a manner which causes a portion of the polymer to deflect in response to a change in electric field and/or arranged in a manner which causes a change in electric field in response to deflection of the polymer, wherein the polymer includes an additive to improve the operating performance of the transducer and wherein an elastic area strain between the polymer deflected to a first position with a first area and the polymer deflected to a second position with a second area is at least about 10%~~

a polymer arranged in a manner which causes a portion of the polymer to deflect in response to a change in electric field and/or arranged in a manner which causes a change in electric field in response to deflection of the polymer, wherein the polymer includes an additive to improve the operating performance of the transducer and wherein the polymer has a maximum elastic area strain of at least about 10 percent.

46. (Previously Presented) The transducer of claim 45 wherein the additive improves at least one of polymer dielectric breakdown strength, maximum linear strain, dielectric constant, elastic modulus, response time, and actuation voltage.

47. (Previously Presented)The transducer of claim 45 wherein the additive comprises at least one of a plasticizer, an antioxidant, and a high dielectric constant particulate.

48. (Previously Presented)The transducer of claim 47 wherein the plasticizer comprises a material selected from a group consisting of high molecular-weight hydrocarbon oil, high molecular-weight hydrocarbon grease, Pentalyne H, Piccovar® AP Hydrocarbon Resins, Admex 760, Plastolein 9720, silicone oil, silicone grease, Floral 105, silicone elastomers, nonionic surfactants, and combinations thereof.

49. (Previously Presented)The transducer of claim 47 wherein the antioxidant is a nonvolatile solid antioxidant.

50. (Previously Presented)The transducer of claim 47 wherein the plasticizer reduces the elastic modulus of the polymer and/or increases the dielectric breakdown strength of the polymer.

51. (Previously Presented)The transducer of claim 45 wherein the additive improves one of the ability of the polymer to convert between mechanical and electrical energy and the adhesion of the polymer.

52. (Previously Presented)The transducer of claim 45 wherein the polymer is elastically pre-strained.

53. (Previously Presented)The transducer of claim 45 wherein the transducer is included in an actuator, a generator, and a sensor.

54. (Currently Amended) A transducer for converting between mechanical and electrical energy, the transducer comprising:

at least two electrodes; and

~~a polymer arranged in a manner which causes a portion of the polymer to deflect from a first position with a first area to a second position with a second area in response to a change in electric field and/or arranged in a manner which causes a change in electric field in response to deflection of the polymer, wherein an initial area of the portion of the polymer is elastically pre-strained to the first area by a factor in the range of about 1.5 times to 50 times to improve the~~

~~mechanical response of the transducer when it deflects from the first position to the second position~~

a polymer arranged in a manner which causes a portion of the polymer to deflect in response to a change in electric field and/or arranged in a manner which causes a change in electric field in response to deflection of the polymer, wherein the polymer includes an additive to improve the operating performance of the transducer and wherein the polymer is elastically pre-strained by a factor in the range of about 1.5 times to 50 times the original area.

55. (Previously Presented) The transducer of claim 54 wherein the additive improves at least one of polymer dielectric breakdown strength, maximum linear strain, dielectric constant, elastic modulus, response time, and actuation voltage.

56. (Previously Presented) The transducer of claim 54 wherein the additive comprises at least one of a plasticizer, an antioxidant, and a high dielectric constant particulate.

57. (Previously Presented) The transducer of claim 56 wherein the plasticizer comprises a material selected from a group consisting of high molecular-weight hydrocarbon oil, high molecular-weight hydrocarbon grease, Pentalene H, Piccovar® AP Hydrocarbon Resins, Admex 760, Plastolein 9720, silicone oil, silicone grease, Floral 105, silicone elastomers, nonionic surfactants, and combinations thereof.

58. (Previously Presented) The transducer of claim 56 wherein the antioxidant is a nonvolatile solid antioxidant.

59. (Previously Presented) The transducer of claim 56 wherein the plasticizer reduces the elastic modulus of the polymer and/or increases the dielectric breakdown strength of the polymer.

60. (Previously Presented) The transducer of claim 54 wherein the additive improves one of the ability of the polymer to convert between mechanical and electrical energy and the adhesion of the polymer.

61. (Previously Presented) The transducer of claim 54 wherein the transducer is included in an actuator, a generator, and a sensor.

62. (Previously Presented)The transducer of claim 54 wherein the transducer is included in one of a robot, a motor, a pump, and a toy.